NOAA CDR Initial Operating Capability (IOC) to Full Operational Capability (FOC) Transition Process

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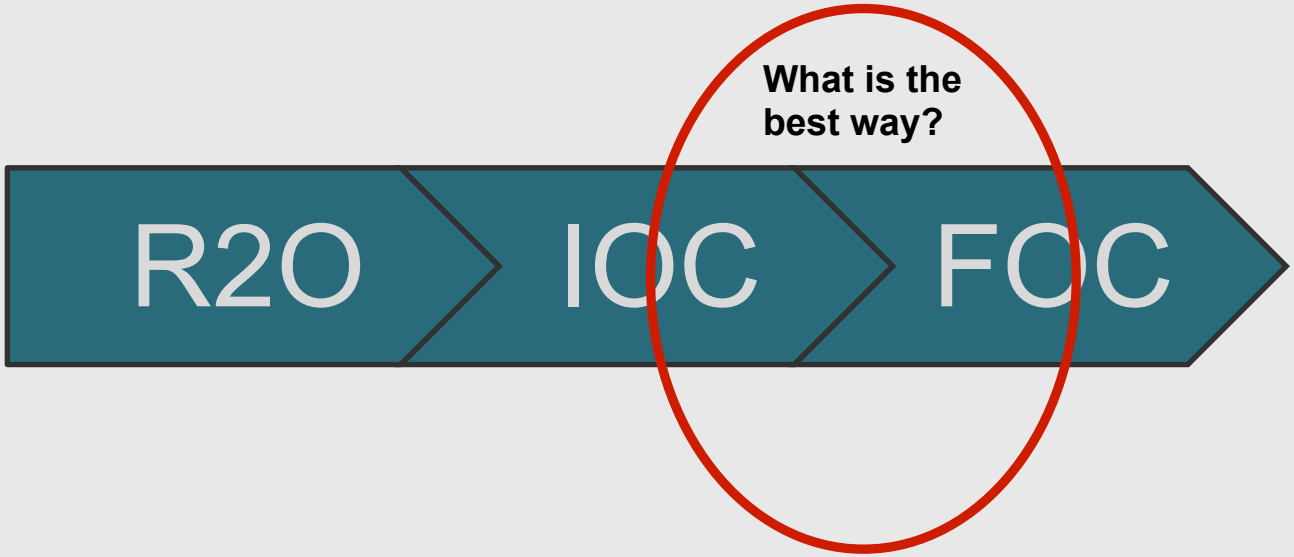
3-CDR Transition Phases



Outline

- Background Information
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  - 3-Phases of CDR Transition to Operation
- FOC CDR Product
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IOC and FOC Definition

- **IOC−Initial Operating Capability:** A CDR development state achieved when a CDR -- including the data set, source code and documentation -- is scientifically defensible and is archived, maintained, and made publicly available by NOAA. NOAA commits to extending the data set in time as possible (Source: CDRP-MISC-0045 Rev 2, 2013).

- **FOC-Full Operational Capability:** A CDR development state achieved when a CDR meets IOC requirements and is being systematically and routinely generated by NOAA using codes and systems that conform to the CDR Program's standards (Source: CDRP-MISC-0045 Rev 2, 2013).

CDR Transition to Operation: Three Phases

1. DP

- **Development Phase (DP)**: Through grant and contract, PIs develop algorithm, source code, dataset, metadata, and documentation
- PI brings the product to at least Maturity Level-3

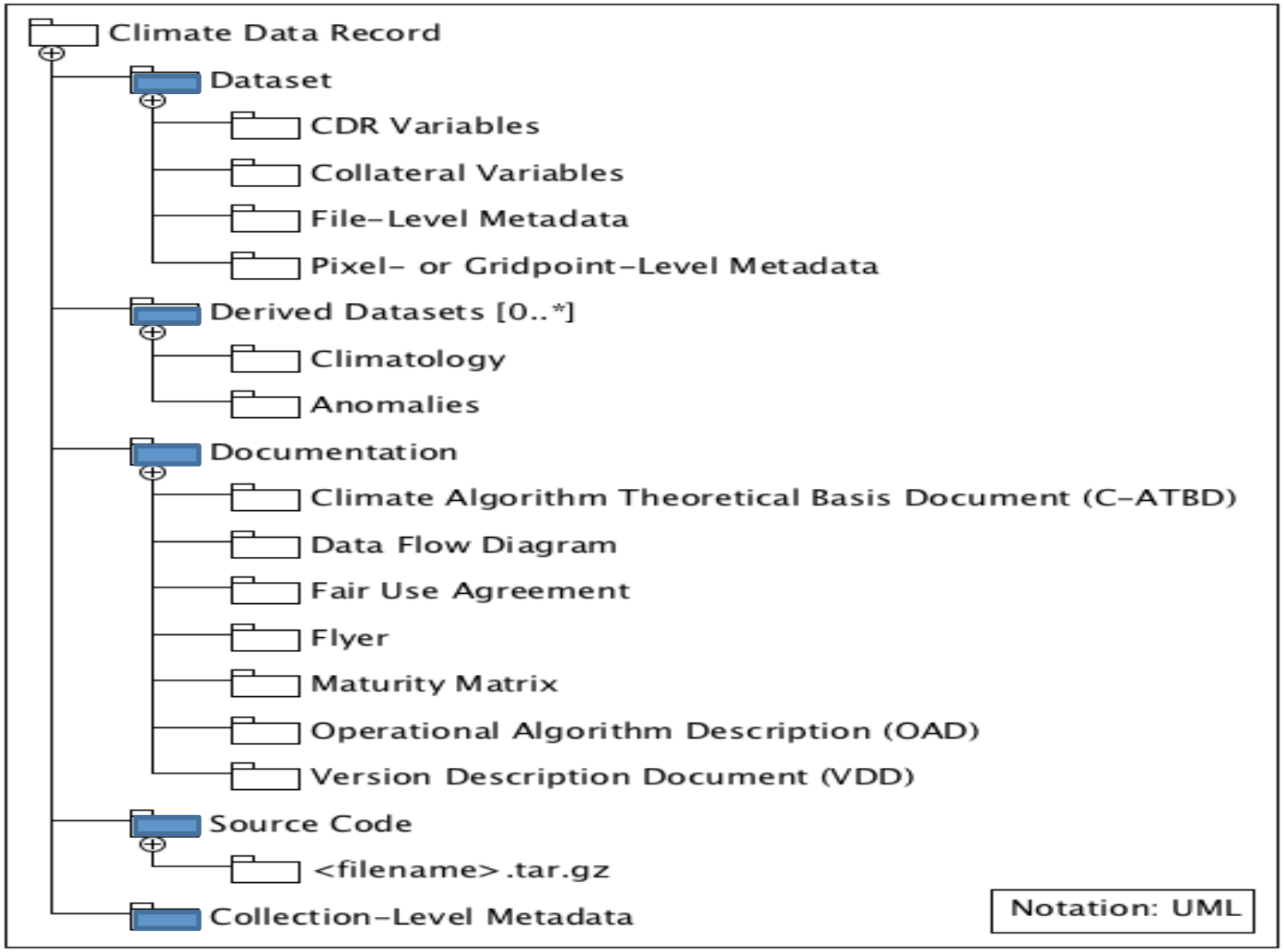
2. IOC

- **IOC Phase**: The dataset, metadata, source code and documentation are quality checked, archived and made openly and transparently available for public access by data center.
- PI provides operational support and maintenance/updates

3. FOC

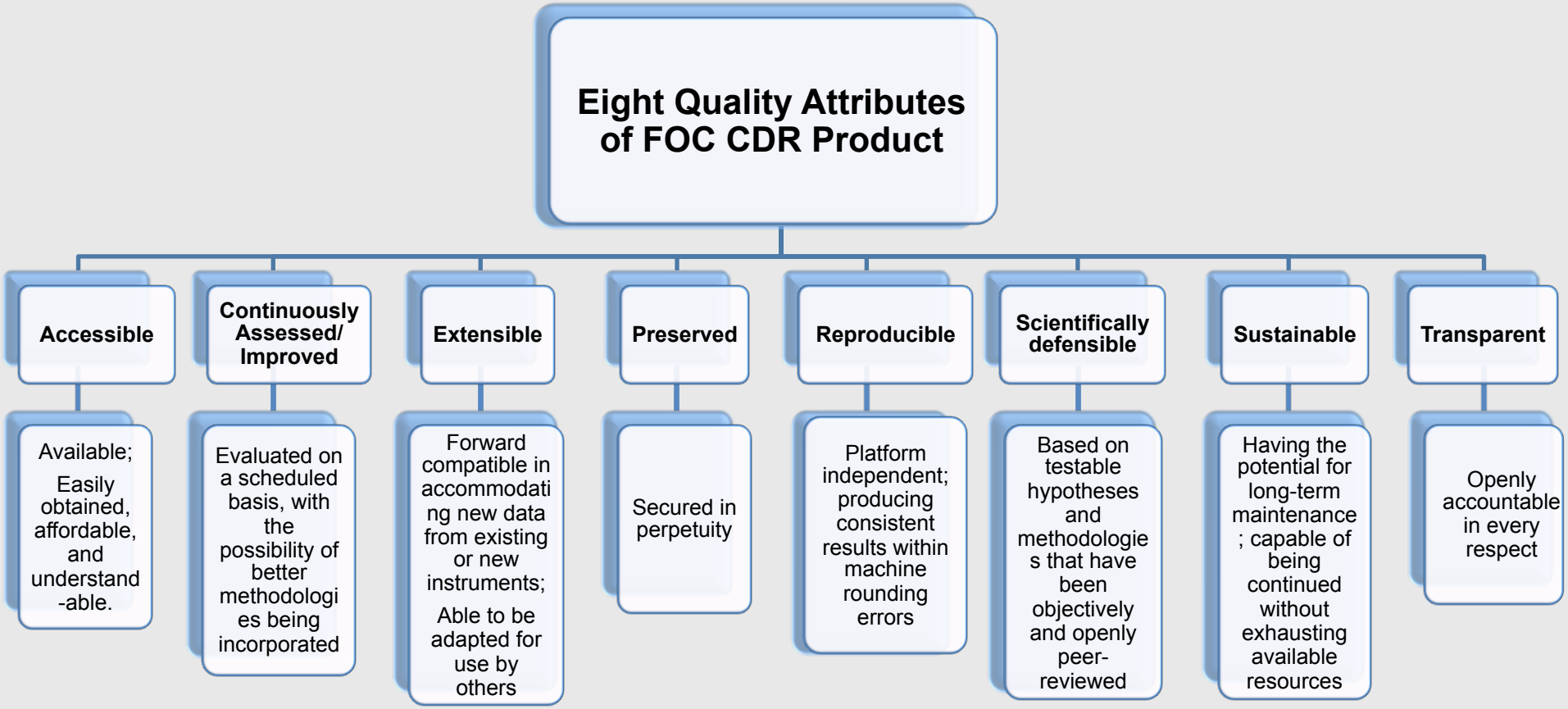
- **FOC Phase**: CDR is systematically and routinely generated by NOAA using codes and systems that conform to the NOAA CDR Program's IT security, coding and documentation standards.
- CDR operational support and maintenance/updates can be accomplished independent of the original PI (Maturity Level-6)

FOC CDR: Product Package (5 Components)



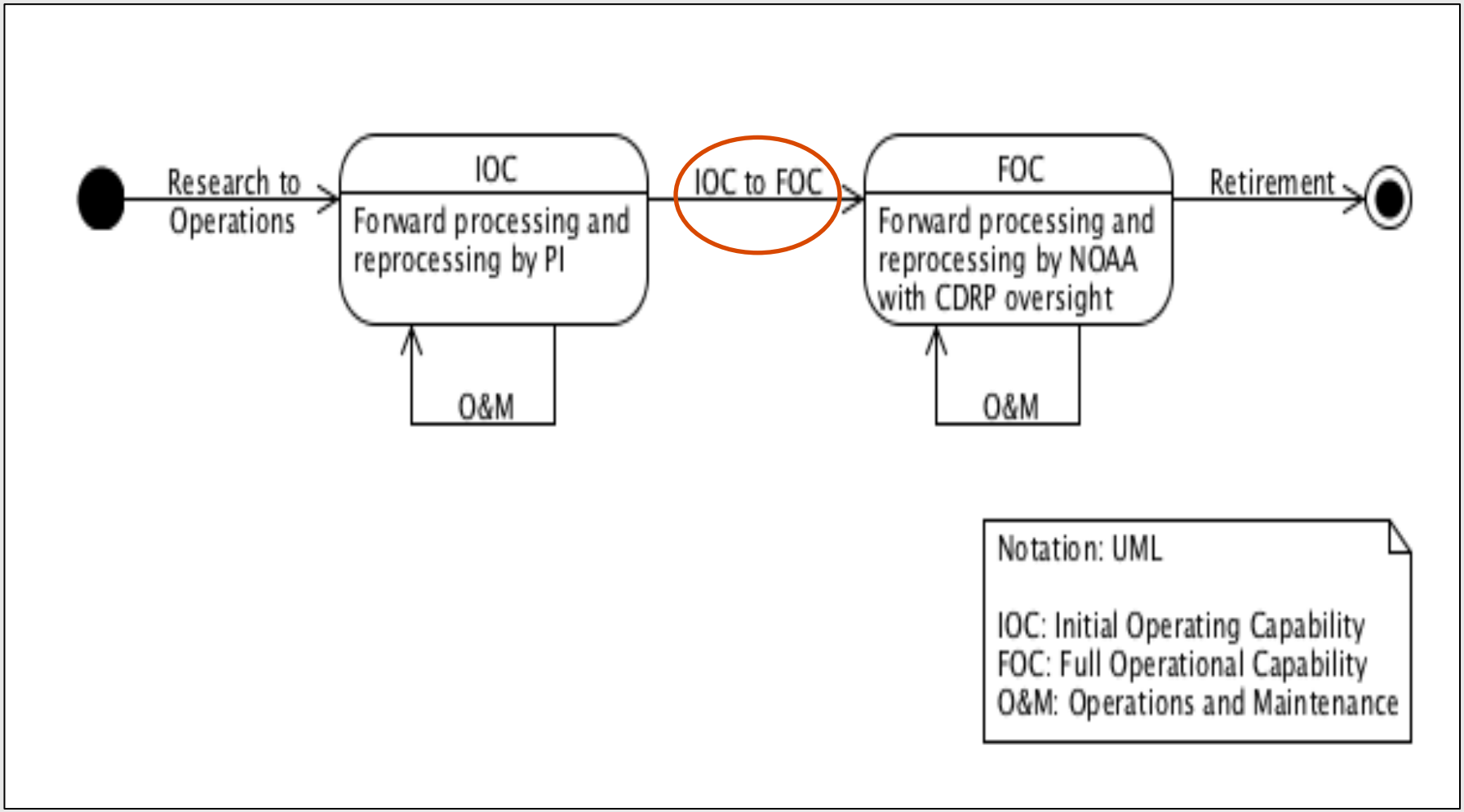
Source: Requirement for FOC (CDRP-REQ-0559)

FOC CDR: Product Quality Attributes



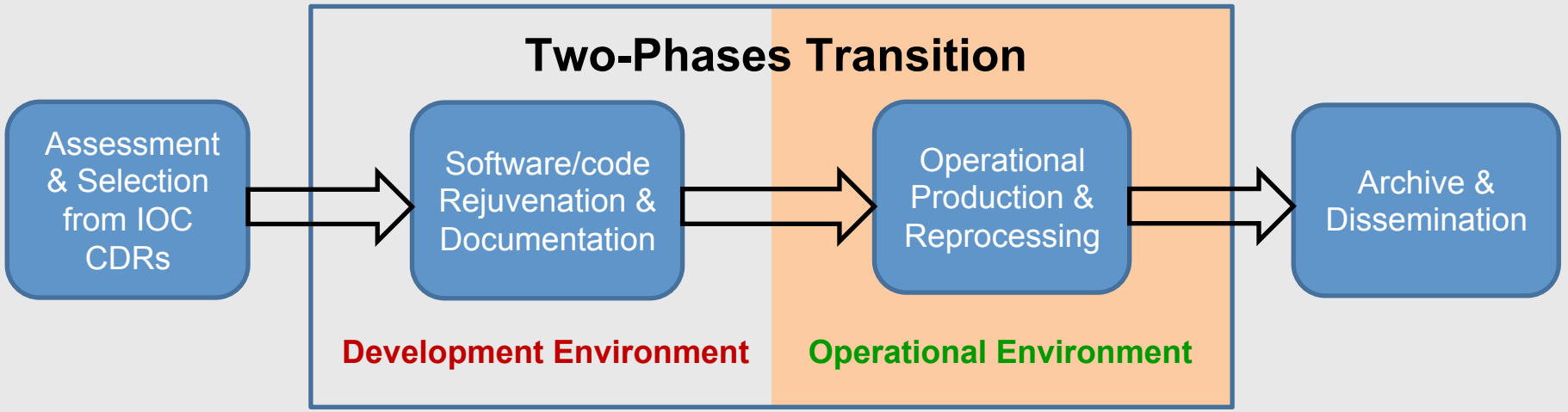
Source: Peng et al. (2015)

CDR IOC to FOC Transition: State Diagram

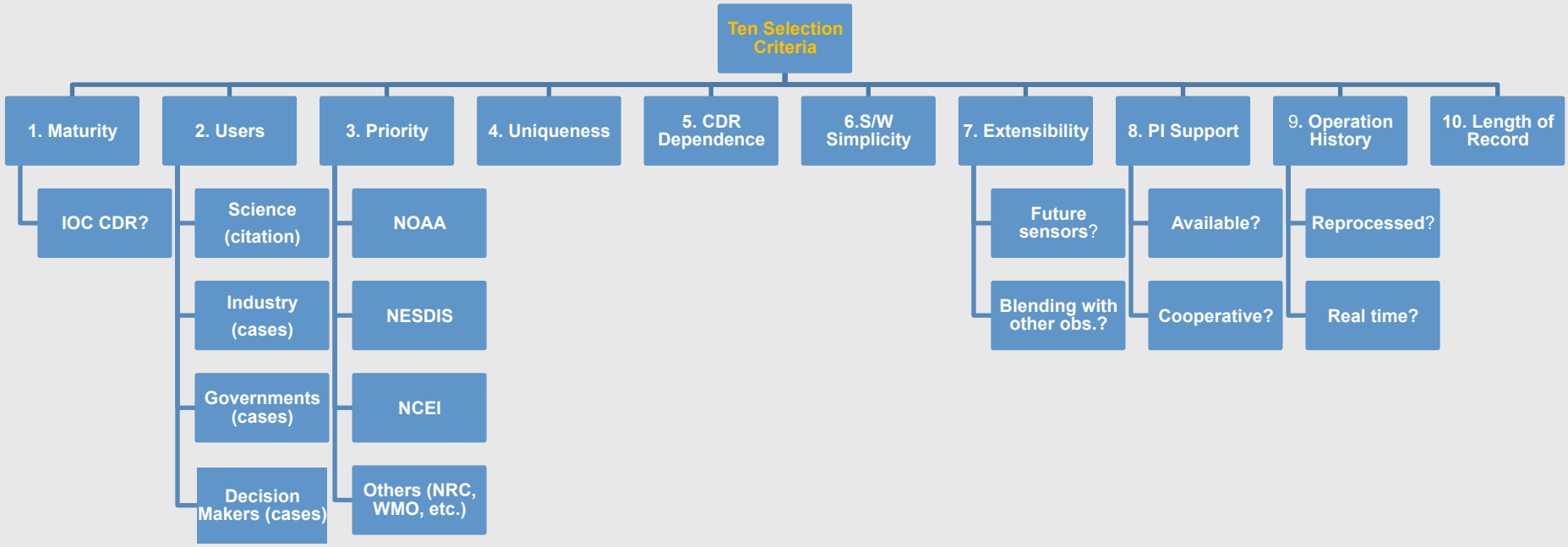


Source: Requirement for FOC (CDRP-REQ-0559)

IOC to FOC Transition: Procedure Diagram



IOC to FOC Transition: FOC CDR Selection



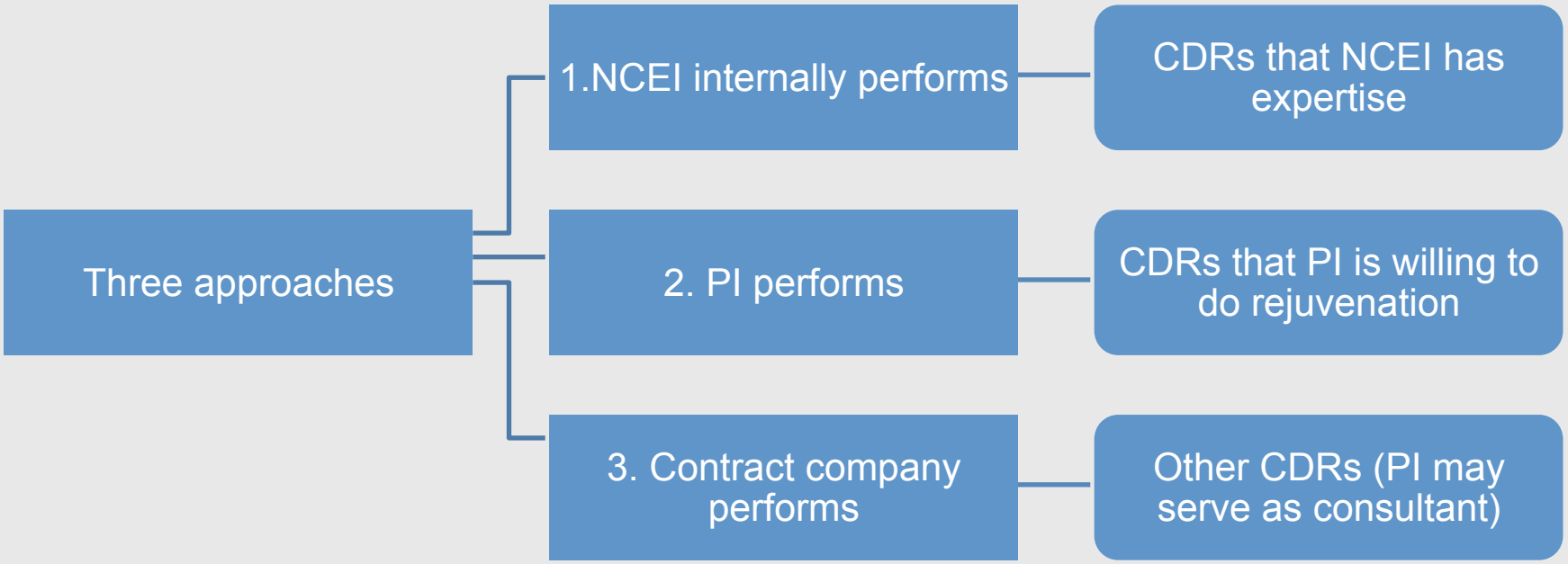
IOC to FOC Transition: 2-Phases

1. **Transition Phase:**
   - –Taking place primarily in a development environment.
   - –Source code will be brought up to CDR FOC standard through software/code rejuvenation and the original IOC results are reproducible.
   - –The resultant operational code is stable, portable, secure, and affordable for long-term maintenance and operation.
   - –Activities are performed collaboratively by CDRP, PI, NCEI/DSD.

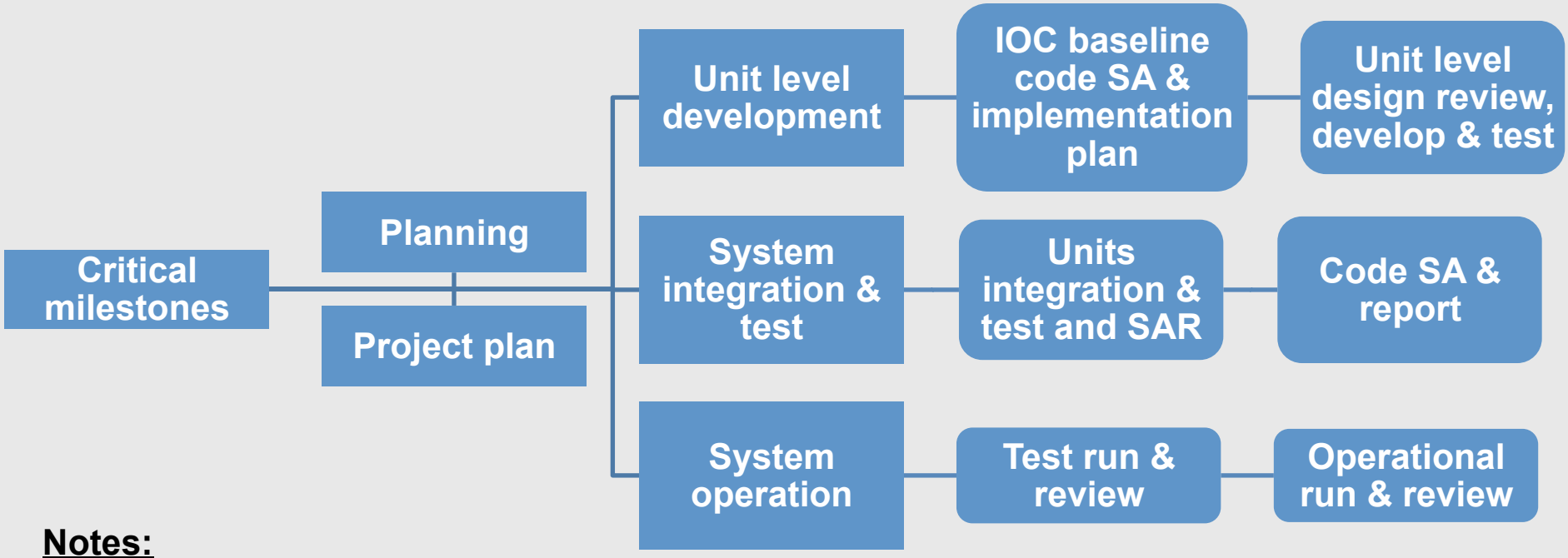
2. **Production Phase**:
   - –Taking place in an operational environment.
   - –Production includes forward processing in as near to real time as possible and periodic reprocessing to include the improvement of science and algorithms.
   - –Activities are performed mainly by CDRP and NCEI/DSD. PI may serve as a consultant.

Software/Code Rejuvenation

Software/Code Rejuvenation: It is the systematic modification of existing code in order to meet the reliability, maintainability, security, and portability standards needed for long term, low cost operations (CDRP-STD-0007).

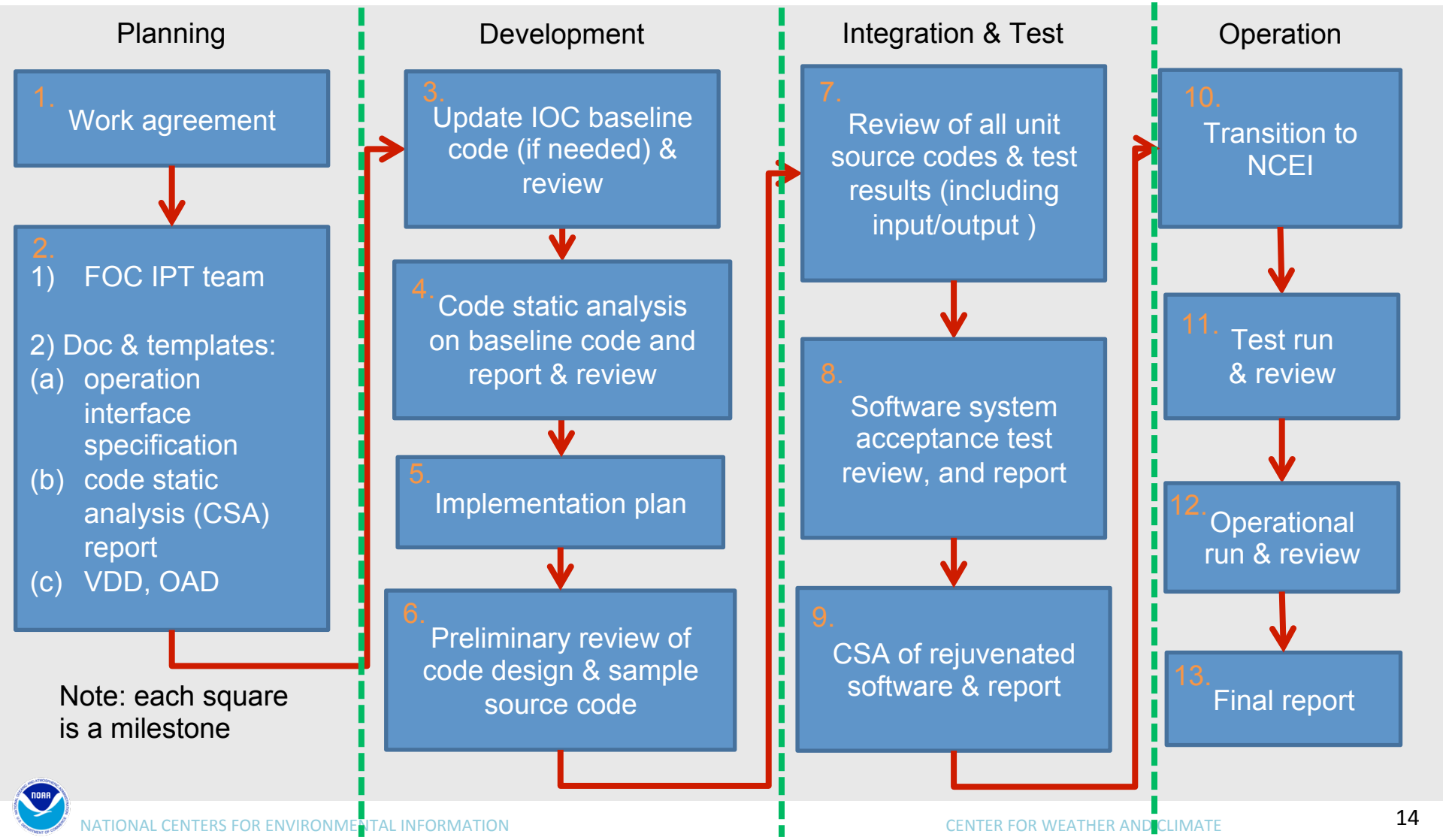


Software/Code Rejuvenation Milestones



Notes:
SA: Static Analysis
SAR: Software Acceptance Review

Example – Procedures of PI Performing Code Rejuvenation



Summary

- We are still working to find the best way for IOC to FOC transition. Three approaches are being explored to perform the transition:
  - –NCEI Internally performs transition
  - –PIs perform transition
  - –Supporting contract company performs transition
- Four-steps procedures have been used so far for IOC to FOC transition:
  - –Assessment and selection of CDR candidates
  - –Software/code rejuvenation and documentation
  - –Operational production and reprocessing
  - –Products archive and dissemination

Questions?

NOAA's CDR Program at National Centers for Environmental Information

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www.ncei.noaa.gov
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